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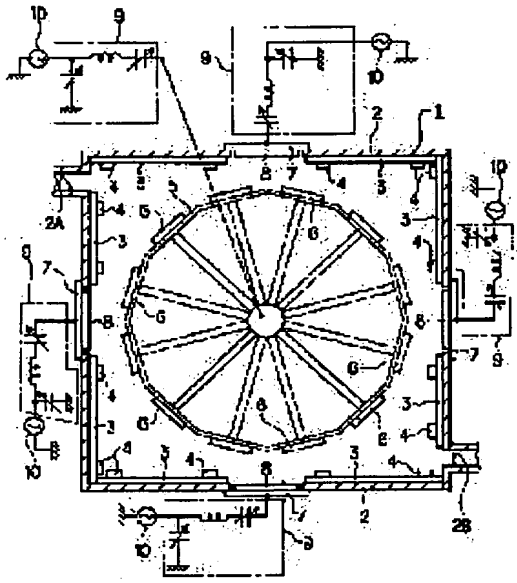
(54) SEMICONDUCTOR FILM FORMING APPARATUS



(57)Abstract:
PURPOSE: To enhance yield of manufacture in a semiconductor film forming apparatus by setting a maximum height of a surface roughness accuracy of a fixing member in the apparatus to a range of a specific value.
CONSTITUTION: A plurality of film-coating preventive plates 3 formed of quartz glass are stretched around an inner wall of a film forming chamber 2. The plates 3 prevent a coating film (silicon oxide film) from coating the inner wall of the chamber 2 when the oxide film is formed on a main surface of a semiconductor wafer 6. The surface of each plate 3 is surface treated such as frosted, sandblasted, GBB-treated, etc., and its surface roughness accuracy is set to a maximum height of about 5 to 20μm. The plates 3 enhance coverage of the coating film covering the surface to prevent the coating film from being peeled and dropped from the surface.

CLAIMS

[Claim(s)]
[Claim 1] Semi-conductor membrane formation equipment characterized by setting the surface roughness precision of said holddown member as the maximum height of 4 micrometers thru/or 15 micrometers in the semi-conductor membrane formation equipment with which an adhesion-proof board is fixed to the wall of a membrane formation chamber by the holddown member.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] Especially this invention is applied to the semi-conductor membrane formation equipment with which an adhesion-proof board is fixed to the wall of a membrane formation chamber by the holddown member about semi-conductor membrane formation equipment, and relates to an effective technique.
[0002]
[Description of the Prior Art] As membrane formation equipment used by the semi-conductor manufacturing technology, there is a suitable RF (Radio Frequency) sputtering system for membrane formation of a metal membrane, an insulator layer, etc. This RF sputtering system has 2 pole cold cathode glow discharge structure which consists of cathode and an anode plate, impresses high-frequency voltage to inter-electrode, generates glow discharge, and forms membrane formation using the spatter phenomenon on the front face of a target on cathode.
[0003] Said RF sputtering system arranges a semiconductor wafer in a membrane formation chamber, and forms membrane formation of a metal membrane, an insulator layer, etc. on the principal plane of this semiconductor wafer. A membrane formation chamber is formed for example, by stainless steel material. The adhesion-proof board which consists for example, of ceramic material is spread around by the wall of a membrane formation chamber. In case this adhesion-proof board forms membrane formation on the principal plane of a semiconductor wafer, it has prevented that the covering film covers the wall of a membrane formation chamber.
[0004] Surface treatment, such as frosting processing, sandblasting processing, and GBB (Grass Beads Brast) processing, is performed to the front face of said adhesion-proof board, and the surface roughness precision is set as the maximum height (Rmax) of 5 micrometers thru/or about 20 micrometers. That is, RF sputtering system set up the surface roughness precision of an adhesion-proof board as mentioned above, when forming membrane formation on the principal plane of an adhesion-proof board and a semiconductor wafer, it raised covering nature with the covering film put on the surface of an adhesion-proof board, and it has prevented that the covering film separates and falls from an adhesion-proof board on the principal plane of a semiconductor wafer.
[0005] Said adhesion-proof board is fixed to the wall of a membrane formation chamber by the holddown member. A holddown member consists of for example, screw members. This holddown member is formed as a purpose which prevents a spatter reaction for example, by polyimide system resin material (for example, BESUPERU material: trademark library-name of Du Pont).
[0006] In addition, the maximum height showing the surface roughness precision of said adhesion-proof board is based on Japanese Industrial Standards [B601(surface roughness)].
[0007]
[Problem(s) to be Solved by the Invention] this invention person found out the following troubles, as a result of examining RF sputtering system which is the above-mentioned semi-conductor membrane formation equipment.
[0008] Said RF sputtering system (semi-conductor membrane formation equipment) sets up

the surface roughness precision of an adhesion-proof board, in order to prevent peeling of the covering film put on the surface of an adhesion-proof board, and it is raising covering nature with the covering film put on the front face of an adhesion-proof board, and the front face of this adhesion-proof board. However, any setup cannot be found about the surface roughness precision of the holddown member (screw member) for fixing an adhesion-proof board to the wall of a membrane formation chamber, and the surface roughness precision of a holddown member is smooth compared with the adhesion-proof board. For this reason, in case membrane formation is formed on the principal plane of the semiconductor wafer arranged in a membrane formation chamber, covering nature with the covering film put on the front face of a holddown member and this holddown member falls, the covering film separates and falls from a holddown member to the front face of a semiconductor wafer, and a defect arises in a semiconductor wafer. That is, there was a problem that the yield on manufacture with RF sputtering system fell.

[0009] The purpose of this invention is to offer the technique which can raise the yield on manufacture with semi-conductor membrane formation equipment.

[0010] As new along [said] this invention a description as the other purposes will become clear by description and the accompanying drawing of this specification.

[0011]

[Means for Solving the Problem] It will be as follows if the outline of a typical thing is briefly explained among invention indicated in this application.

[0012] In the semi-conductor membrane formation equipment with which an adhesion-proof board is fixed to the wall of a membrane formation chamber by the holddown member, the surface roughness precision of said holddown member is set as the maximum height of 4 micrometers thru/or 15 micrometers.

[0013]

[Function] Since according to the means mentioned above covering nature with the covering film put on the surface of a holddown member becomes high when forming membrane formation on the front face of a holddown member, and the principal plane of the semiconductor wafer arranged in a membrane formation chamber, it can prevent that ****-ed separates and falls from the front face of a holddown member on the principal plane of a semiconductor wafer. Consequently, since the defect of the semiconductor wafer by the peeling omission of the covering film can be prevented, the yield on manufacture with semi-conductor membrane formation equipment can be raised.

[0014]

[Example] One example of this invention which applied this invention to RF sputtering system which is semi-conductor membrane formation equipment is explained with reference to a drawing. In addition, in the complete diagram for explaining an example, what has the same function attaches the same sign, and explanation of the repeat is omitted.

[0015] the part which shows the outline configuration of RF sputtering system whose drawing 1 is one example of this invention -- the important section expanded sectional view of drawing 1 and drawing 3 of a cross-section block diagram and drawing 2 are the important section expanded sectional views of drawing 2 .

[0016] As shown in drawing 1 , in the membrane formation chamber 2, the RF sputtering system 1 which is semi-conductor membrane formation equipment arranges two or more semiconductor wafers 6, and forms for example, the oxidation silicon film (SiO2) as membrane formation on each principal plane of two or more of these semiconductor wafers 6.

[0017] Each of two or more of said semiconductor wafers 6 is laid in the substrate electrode (anode plate) 5. RF matching circuit 9 is connected to the substrate electrode 5, and the RF power source 10 is connected to this RF matching circuit 9.

[0018] Ar gas supply line 2A which supplies for example, Ar (argon) gas in a membrane formation chamber is connected with the end of said membrane formation chamber 2. Moreover, evacuation tubing 2B which makes low the atmospheric pressure in a membrane formation chamber is connected with the other end of the membrane formation chamber 2. That is, it fills up with Ar gas in the membrane formation chamber 2.

[0019] Four target electrodes (cathode) 7 are arranged at said membrane formation chamber 2.

RF matching circuit 9 is connected to each of four TAGETO electrodes 7 for every each, and the RF power source 10 is connected to each of this RF matching circuit 9 for every each. Quartz TAGETO 8 is laid in each of four TAGETO electrodes 7 for every each. That is, the RF sputtering system 1 of this example has 2 pole cold cathode glow discharge structure which consists of a TAGETO electrode (cathode) 7 and a substrate electrode (anode plate) 5, impresses high-frequency voltage to inter-electrode [these], generates a glow discharge pole, and forms the oxidation silicon film on the principal plane of a semiconductor wafer 6 using the spatter phenomenon in the front face of quartz TAGETO 8 on the TAGETO electrode 7.

[0020] Two or more adhesion-proof boards 3 formed with quartz glass are spread around by the wall of said membrane formation chamber 2. In case this adhesion-proof board 3 forms the oxidization silicon film on the principal plane of a semiconductor wafer 6, it has prevented that the covering film (oxidization silicon film) covers the wall of the membrane formation chamber 2. Surface treatment, such as frosting processing, sandblasting processing, and GBB processing, is performed to the front face of an adhesion-proof board 3, and the surface roughness precision is set as the maximum height (Rmax) of 5 micrometers thru/or about 20 micrometers. This adhesion-proof board 3 raised covering nature with the covering film put on that front face, and has prevented that the covering film separates and falls from that front face.

[0021] Each of two or more of said adhesion-proof boards 3 is fixed to the wall of the membrane formation chamber 2 by the holddown member 4, as shown in drawing 1 and drawing 2 R> 2. A holddown member 4 consists of screw members which consist for example, of polyimide system resin material. In this holddown member 4, the surface roughness precision of head 4A exposed in the membrane formation chamber 2 is set as 4 micrometers thru/or 15 micrometers. As shown in drawing 3 , when it cuts at a flat surface perpendicular to the front face of head 4A of a holddown member 4, the surface roughness precision of this head 4A takes criteria die length, for example, 3mm, from the cross-section curve which carried out expansion record of the profile which appears in this cut end, and expresses the height (Rmax) of the highest crest in the meantime and the deepest trough per mum. In addition, surface roughness precision is indicated by the mechanical-engineering handbook [JIS(Japanese Industrial Standards) B601 and surface roughness] of the Japan Society of Mechanical Engineers issue, for example.

[0022] Thus, in case the RF sputtering system 1 constituted forms the oxidation silicon film on the principal plane of the semiconductor wafer 6 arranged in the membrane formation chamber 2, the covering film (oxidation silicon film) puts it on the front face of head 4A of a holddown member 4. Since according to the experiment of this invention person the covering nature of this covering film can be raised as mentioned above from falling even if too coarse depending on the surface roughness precision of head 4A by setting the surface roughness precision of head 4A of a holddown member 4 as the maximum height of 4 micrometers thru/or 15 micrometers even if it is too smooth, it can prevent that the covering film separates and falls from the front face of head 4A.

[0023] In addition, head 4A is not limited to the screw member exposed in the membrane formation chamber 1, but may constitute said holddown member 4 from a pan screw member, a tap bolt member, an embedded bolt member, etc.

[0024] Thus, in the RF sputtering system (semi-conductor membrane formation equipment) 1 with which an adhesion-proof board 3 is fixed to the wall of the membrane formation chamber 2 by the holddown member 4, the surface roughness precision of said holddown member 4 is set as the maximum height of 4 micrometers thru/or 15 micrometers. It can prevent that ****-ed separates and falls from the front face of a holddown member 4 on the principal plane of a semiconductor wafer 6 by this configuration since covering nature with the covering film put on the front face of a holddown member 4 becomes high when forming the oxidation silicon film (membrane formation) on the front face of a holddown member 4, and the principal plane of the semiconductor wafer 6 arranged in the membrane formation chamber 1. Consequently, since the defect of the semiconductor wafer 6 by the peeling omission of the covering film can be prevented, the yield on manufacture with the RF sputtering system 1 can be raised.

[0025] As mentioned above, although invention made by this invention person was concretely explained based on said example, as for this invention, it is needless to say for it to be able to change variously in the range which is not limited to said example and does not deviate from the summary.
[0026] For example, this invention is applicable to all sputtering systems, such as magnetron sputtering, an ion beam spatter, a bias spatter, and a reactant spatter.
[0027] Moreover, this invention is applicable to plasma-CVD equipment.
[0028]
[Effect of the Invention] It will be as follows if the effectiveness acquired by the typical thing among invention indicated in this application is explained briefly.
[0029] The yield on manufacture with semi-conductor membrane formation equipment can be raised.

TECHNICAL FIELD

[Industrial Application] Especially this invention is applied to the semi-conductor membrane formation equipment with which an adhesion-proof board is fixed to the wall of a membrane formation chamber by the holddown member about semi-conductor membrane formation equipment, and relates to an effective technique.

PRIOR ART

[Description of the Prior Art] As membrane formation equipment used by the semi-conductor manufacturing technology, there is a suitable RF (Radio Frequency) sputtering system for membrane formation of a metal membrane, an insulator layer, etc. This RF sputtering system has 2 pole cold cathode glow discharge structure which consists of cathode and an anode plate, impresses high-frequency voltage to inter-electrode, generates glow discharge, and forms membrane formation using the spatter phenomenon on the front face of a target on cathode.
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EFFECT OF THE INVENTION

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MEANS

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OPERATION

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EXAMPLE

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Society of Mechanical Engineers issue, for example.
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[0023] In addition, head 4A is not limited to the screw member exposed in the membrane formation chamber 1, but may constitute said holddown member 4 from a pan screw member, a tap bolt member, an embedded bolt member, etc.
[0024] Thus, in the RF sputtering system (semi-conductor membrane formation equipment) 1 with which an adhesion-proof board 3 is fixed to the wall of the membrane formation chamber 2 by the holddown member 4, the surface roughness precision of said holddown member 4 is set as the maximum height of 4 micrometers thru/or 15 micrometers. It can prevent that ****-ed separates and falls from the front face of a holddown member 4 on the principal plane of a semiconductor wafer 6 by this configuration since covering nature with the covering film put on the front face of a holddown member 4 becomes high when forming the oxidation silicon film (membrane formation) on the front face of a holddown member 4, and the principal plane of the semiconductor wafer 6 arranged in the membrane formation chamber 1. Consequently, since the defect of the semiconductor wafer 6 by the peeling omission of the covering film can be prevented, the yield on manufacture with the RF sputtering system 1 can be raised.
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[0026] For example, this invention is applicable to all sputtering systems, such as magnetron sputtering, an ion beam spatter, a bias spatter, and a reactant spatter.
[0027] Moreover, this invention is applicable to plasma-CVD equipment.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] the part which shows the outline configuration of RF sputtering system which is one example of this invention -- a cross-section block diagram.
[Drawing 2] The important section expanded sectional view of drawing 1 .
[Drawing 3] The important section expanded sectional view of drawing 2 .
[Description of Notations]
1 [-- An adhesion-proof board, 4 / -- A holddown member, 4A / -- A head, 5 / -- A substrate electrode (cathode), 6 / -- A semiconductor wafer, 7 / -- A target electrode (anode plate) 8 / -- A quartz target, 9 / -- RF matching circuit, 10 / -- RF power source.] -- RF sputtering system (semi-conductor membrane formation equipment), 2 -- A membrane formation chamber, 2 A--Ar supply pipe, 2B -- Evacuation tubing, 3

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特開平7－58013

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Ｈ０１Ｌ　21/203		Ｓ　8122－4M		
Ｃ２３Ｃ　14/00		Ｂ　8520－4K		
Ｈ０１Ｌ　21/205				

審査請求　未請求　請求項の数１　ＯＬ　（全　４　頁）

(21)出願番号　特願平5－198184

(22)出願日　平成５年(1993)８月10日

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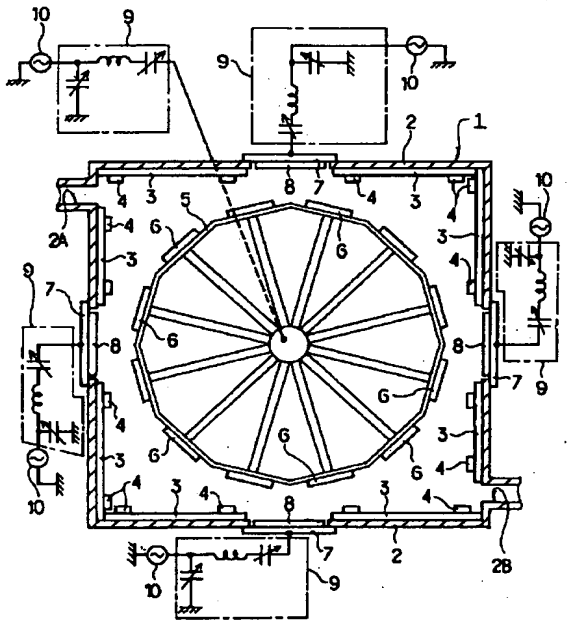
最終頁に続く

(54)【発明の名称】　半導体成膜装置

(57)【要約】
【目的】　半導体成膜装置での製造上の歩留まりを高める。
【構成】　成膜チャンバ２の内壁に防着板３が固定部材４で固定される半導体成膜装置１において、前記固定部材４の表面粗さ精度を最大高さ４μｍ乃至１５μｍに設定する。

図1



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【特許請求の範囲】

【請求項１】　成膜チャンバの内壁に防着板が固定部材で固定される半導体成膜装置において、前記固定部材の表面粗さ精度が最大高さ４μｍ乃至１５μｍに設定されていることを特徴とする半導体成膜装置。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は、半導体成膜装置に関し、特に、成膜チャンバの内壁に防着板が固定部材で固定される半導体成膜装置に適用して有効な技術に関するものである。

【０００２】

【従来の技術】半導体製造技術で使用される成膜装置として、例えば金属膜、絶縁膜等の成膜に好適なＲＦ（Ｒadio Ｆrequency）スパッタ装置がある。このＲＦスパッタ装置は、陰極と陽極とからなる２極冷陰極グロー放電構造を持ち、電極間に高周波電圧を印加してグロー放電を発生させ、陰極上のターゲット表面でのスパッタ現象を利用して成膜の形成を行う。

【０００３】前記ＲＦスパッタ装置は、成膜チャンバ内に半導体ウエーハを配置し、この半導体ウエーハの主面上に金属膜、絶縁膜等の成膜を形成する。成膜チャンバは例えばステンレス材で形成される。成膜チャンバの内壁には例えばセラミック材からなる防着板が張り巡らされている。この防着板は、半導体ウエーハの主面上に成膜を形成する際、成膜チャンバの内壁に被着膜が被着するのを防止している。

【０００４】前記防着板の表面にはフロスト処理、サンドブラスト処理、ＧＢＢ（Ｇrass Ｂeads Ｂrast）処理等の表面処理が施され、その表面粗さ精度は例えば最大高さ（Ｒmax）５μｍ乃至２０μｍ程度に設定される。つまり、ＲＦスパッタ装置は、防着板の表面粗さ精度を前述のように設定し、防着板と半導体ウエーハの主面上に成膜を形成する時に防着板の表面に被着する被着膜との被着性を高め、防着板から半導体ウエーハの主面上に被着膜が剥がれ落ちるのを防止している。

【０００５】前記防着板は成膜チャンバの内壁に固定部材により固定される。固定部材は例えばネジ部材で構成される。この固定部材は、スパッタ反応を防止する目的として、例えばポリイミド系樹脂材（例えばベスペル材：デュポン社の商標登録名）で形成される。

【０００６】なお、前記防着板の表面粗さ精度を表す最大高さは、日本工業規格〔Ｂ６０１（表面粗さ）〕に基づく。

【０００７】

【発明が解決しようとする課題】本発明者は、前述の半導体成膜装置であるＲＦスパッタ装置について検討した結果、以下の問題点を見出した。

【０００８】前記ＲＦスパッタ装置（半導体成膜装置）は、防着板の表面に被着する被着膜の剥がれを防止するために防着板の表面粗さ精度を設定し、防着板の表面とこの防着板の表面に被着する被着膜との被着性を高めている。しかしながら、成膜チャンバの内壁に防着板を固定するための固定部材（ネジ部材）の表面粗さ精度については何の設定もなく、固定部材の表面粗さ精度は防着板に比べて平滑になっている。このため、成膜チャンバ内に配置された半導体ウエーハの主面上に成膜を形成する際、固定部材とこの固定部材の表面に被着する被着膜との被着性が低下し、固定部材から半導体ウエーハの表面に被着膜が剥がれ落ち、半導体ウエーハに不良が生じる。つまり、ＲＦスパッタ装置での製造上の歩留まりが低下するという問題があった。

2

【０００９】本発明の目的は、半導体成膜装置での製造上の歩留まりを高めることが可能な技術を提供することにある。

【００１０】本発明の前記ならびにその他の目的と新規な特徴は、本明細書の記述及び添付図面によって明らかになるであろう。

【００１１】

【課題を解決するための手段】本願において開示される発明のうち、代表的なものの概要を簡単に説明すれば、下記のとおりである。

【００１２】成膜チャンバの内壁に防着板が固定部材で固定される半導体成膜装置において、前記固定部材の表面粗さ精度を最大高さ４μｍ乃至１５μｍに設定する。

【００１３】

【作用】上述した手段によれば、固定部材の表面と、成膜チャンバ内に配置された半導体ウエーハの主面上に成膜を形成する時に固定部材の表面に被着する被着膜との被着性が高くなるので、固定部材の表面から半導体ウエーハの主面上に被性膜が剥がれ落ちるのを防止できる。この結果、被着膜の剥がれ落ちによる半導体ウエーハの不良を防止できるので、半導体成膜装置での製造上の歩留まりを高めることができる。

【００１４】

【実施例】半導体成膜装置であるＲＦスパッタ装置に本発明を適用した、本発明の一実施例について図面を参照して説明する。なお、実施例を説明するための全図において、同一機能を有するものは同一符号を付け、その繰り返しの説明は省略する。

【００１５】図１は本発明の一実施例であるＲＦスパッタ装置の概略構成を示す一部断面構成図、図２は図１の要部拡大断面図、図３は図２の要部拡大断面図である。

【００１６】図１に示すように、半導体成膜装置であるＲＦスパッタ装置１は、成膜チャンバ２内に複数の半導体ウエーハ６を配置し、この複数の半導体ウエーハ６の夫々の主面上に成膜として例えば酸化珪素膜（SiO_2）を形成する。

【００１７】前記複数の半導体ウエーハ６の夫々は基板電極（陽極）５に載置される。基板電極５にはＲＦマッチ

ング回路９が接続され、このＲＦマッチング回路９にはＲＦ電源１０が接続される。

【００１８】前記成膜チャンバ２の一端には、成膜チャンバ内に例えばＡｒ(アルゴン)ガスを供給するＡｒガス供給管２Ａが連結される。また、成膜チャンバ２の他端には、成膜チャンバ内の気圧を低くする真空排気管２Ｂが連結される。つまり、成膜チャンバ２内にはＡｒガスが充填される。

【００１９】前記成膜チャンバ２には４つのターゲット電極(陰極)７が配置される。４つのターゲート電極７の夫々にはＲＦマッチング回路９が夫々毎に接続され、このＲＦマッチング回路９の夫々にはＲＦ電源１０が夫々毎に接続される。４つのターゲート電極７の夫々には石英ターゲート８が夫々毎に載置される。つまり、本実施例のＲＦスパッタ装置１は、ターゲート電極(陰極)７と基板電極(陽極)５とからなる２極冷陰極グロー放電構造を持ち、これらの電極間に高周波電圧を印加してグロー放電極を発生させ、ターゲート電極７上の石英ターゲート８の表面でのスパッタ現象を利用して半導体ウエーハ６の主面上に酸化珪素膜を形成する。

【００２０】前記成膜チャンバ２の内壁には例えば石英ガラスで形成された複数の防着板３が張り巡らされている。この防着板３は、半導体ウエーハ６の主面上に酸化珪素膜を形成する際、成膜チャンバ２の内壁に被着膜(酸化珪素膜)が被着するのを防止している。防着板３の表面にはフロスト処理、サンドブラスト処理、ＧＢＢ処理等の表面処理が施され、その表面粗さ精度は例えば最大高さ(Ｒmax) ５μｍ乃至２０μｍ程度に設定される。この防着板３は、その表面に被着する被着膜との被着性を高め、その表面から被着膜が剥がれ落ちるのを防止している。

【００２１】前記複数の防着板３の夫々は、図１及び図２に示すように、成膜チャンバ２の内壁に固定部材４で固定される。固定部材４は、例えばポリイミド系樹脂材からなるネジ部材で構成される。この固定部材４において、成膜チャンバ２内に露出する頭部４Ａの表面粗さ精度は４μｍ乃至１５μｍに設定される。この頭部４Ａの表面粗さ精度は、図３に示すように、固定部材４の頭部４Ａの表面に垂直な平面で切断した時、この切り口にあらわれる輪郭を拡大記録した断面曲線から基準長さ例えば３ｍｍをとり、この間の最も高い山と最も深い谷との高さ(Ｒmax) をμｍ単位であらわしたものである。なお、表面粗さ精度については、例えば社団法人日本機械学会発行の機械工学便覧〔ＪＩＳ(日本工業規格)Ｂ６０１、表面粗さ〕に記載されている。

【００２２】このように構成されるＲＦスパッタ装置１は、成膜チャンバ２内に配置された半導体ウエーハ６の主面上に酸化珪素膜を形成する際、固定部材４の頭部４Ａの表面上に被着膜(酸化珪素膜)が被着する。この被着膜の被着性は、本発明者の実験によれば、頭部４Ａの表面粗さ精度に依存し、平滑すぎても、粗すぎても低下することから、前述のように、固定部材４の頭部４Ａの表面粗さ精度を最大高さ４μｍ乃至１５μｍに設定することにより高めることができるので、頭部４Ａの表面から被着膜が剥がれ落ちるのを防止できる。

【００２３】なお、前記固定部材４は、頭部４Ａが成膜チャンバ１内に露出するネジ部材に限定されず、さらネジ部材、押えボルト部材、埋込ボルト部材等で構成してもよい。

【００２４】このように、成膜チャンバ２の内壁に防着板３が固定部材４で固定されるＲＦスパッタ装置(半導体成膜装置)１において、前記固定部材４の表面粗さ精度を最大高さ４μｍ乃至１５μｍに設定する。この構成により、固定部材４の表面と、成膜チャンバ１内に配置された半導体ウエーハ６の主面上に酸化珪素膜(成膜)を形成する時に固定部材４の表面に被着する被着膜との被着性が高くなるので、固定部材４の表面から半導体ウエーハ６の主面上に被性膜が剥がれ落ちるのを防止できる。この結果、被着膜の剥がれ落ちによる半導体ウエーハ６の不良を防止できるので、ＲＦスパッタ装置１での製造上の歩留まりを高めることができる。

【００２５】以上、本発明者によってなされた発明を、前記実施例に基づき具体的に説明したが、本発明は、前記実施例に限定されるものではなく、その要旨を逸脱しない範囲において種々変更可能であることは勿論である。

【００２６】例えば、本発明は、マグネトロンスパッタ、イオンビームスパッタ、バイアススパッタ、反応性スパッタ等の全てのスパッタ装置に適用できる。

【００２７】また、本発明は、プラズマＣＶＤ装置に適用できる。

【００２８】

【発明の効果】本願において開示される発明のうち代表的なものによって得られる効果を簡単に説明すれば、下記のとおりである。

【００２９】半導体成膜装置での製造上の歩留まりを高めることができる。

【図面の簡単な説明】

【図１】本発明の一実施例であるＲＦスパッタ装置の概略構成を示す一部断面構成図。

【図２】図１の要部拡大断面図。

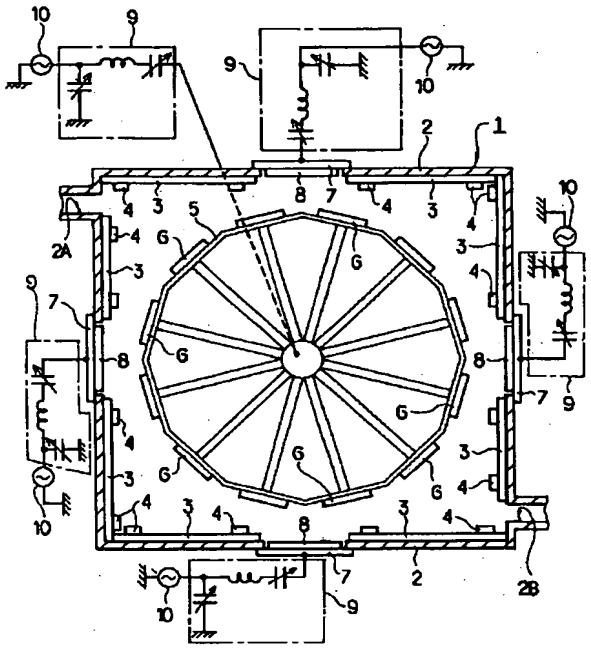
【図３】図２の要部拡大断面図。

【符号の説明】

１…ＲＦスパッタ装置(半導体成膜装置)、２…成膜チャンバ、２Ａ…Ａｒ供給管、２Ｂ…真空排気管、３…防着板、４…固定部材、４Ａ…頭部、５…基板電極(陰極)、６…半導体ウエーハ、７…ターゲット電極(陽極)、８…石英ターゲット、９…ＲＦマッチング回路、１０…ＲＦ電源。

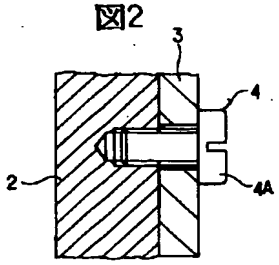
【図１】

図1



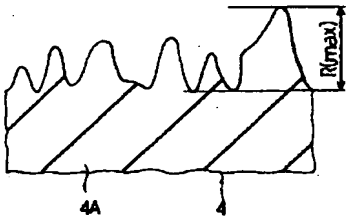
【図２】

図2



【図３】

図3



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